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ABSTRACT

Current interpretations of central Appalachia's chronic poverty focus on the region's economic dependence on the bituminous coal industry, controlled by absentee investors and serving an external market. Such theories overlook the ways in which the agricultural sector shaped subsequent industrial development. By analyzing the farm economy of 16 southeastern Kentucky counties during the 19th century, this report illuminates the developmental links between central Appalachia's agrarian and industrial sectors. During the 1830s and 1840s a market for mountain livestock existed in the newly opened cotton areas of the deep South. Nevertheless, by 1850 Appalachian farm production was organized around simple subsistence rather than commercial production. With cheap land and abundant family labor, mountain farmers were not compelled to produce for the commercial market. External conditions also affected the direction taken by Appalachia's farm economy as productivity-enhancing farm equipment, emerging transportation systems, and newly established agricultural colleges aimed at the commercially competitive flatland farmer. When pitted against assured prospects elsewhere, the mountain region could not sustain the interest of investors. Further, the supply and demand conditions characteristic of subsistence farming precluded the development of industries producing farm inputs or processing farm surpluses. This inhibition of industrial capital formation meant that local capital was not available to develop the region's timber and coal resources for export. When the bituminous coal industry arrived to satisfy the resource demands of distant industry, absentee investors met with little competition for control of Appalachia's modern industrial economy. This report contains 48 references. (SV)

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The Limits of Subsistence: Agriculture and Industry in Central Appalachia

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Since the late nineteenth century the rural economy of central Appalachia, embracing southern West Virginia, southwestern Virginia, and eastern Kentucky, has been almost wholly dependent upon the bituminous coal industry. Indeed, Appalachia has become virtually synonymous with coal and, more particularly, with problems of the notoriously dangerous, cyclically unstable, and highly competitive industry. Historians attribute Appalachia's chronic rural poverty not simply to the coal industry, however, but to the way in which the coal industry developed there: through absentee capital investment and for markets outside the region.[1] The facts of absentee control and export orientation support the common interpretation of Appalachia as an internal U.S. economic colony.[2]

The coal industry so dominates the rural economy of central Appalachia that one may question a focus on the region's agricultural history. Existing colonial interpretations of Appalachia, for example, take for granted the region's comparative advantage for coal production and assume the region lacked an economy until mines were opened at the turn of the century. But this overlooks the development of the agricultural sector that was the base of Appalachia's preindustrial economy, and, more significantly, ignores the ways in which the agricultural sector fundamentally shaped subsequent industrial development.

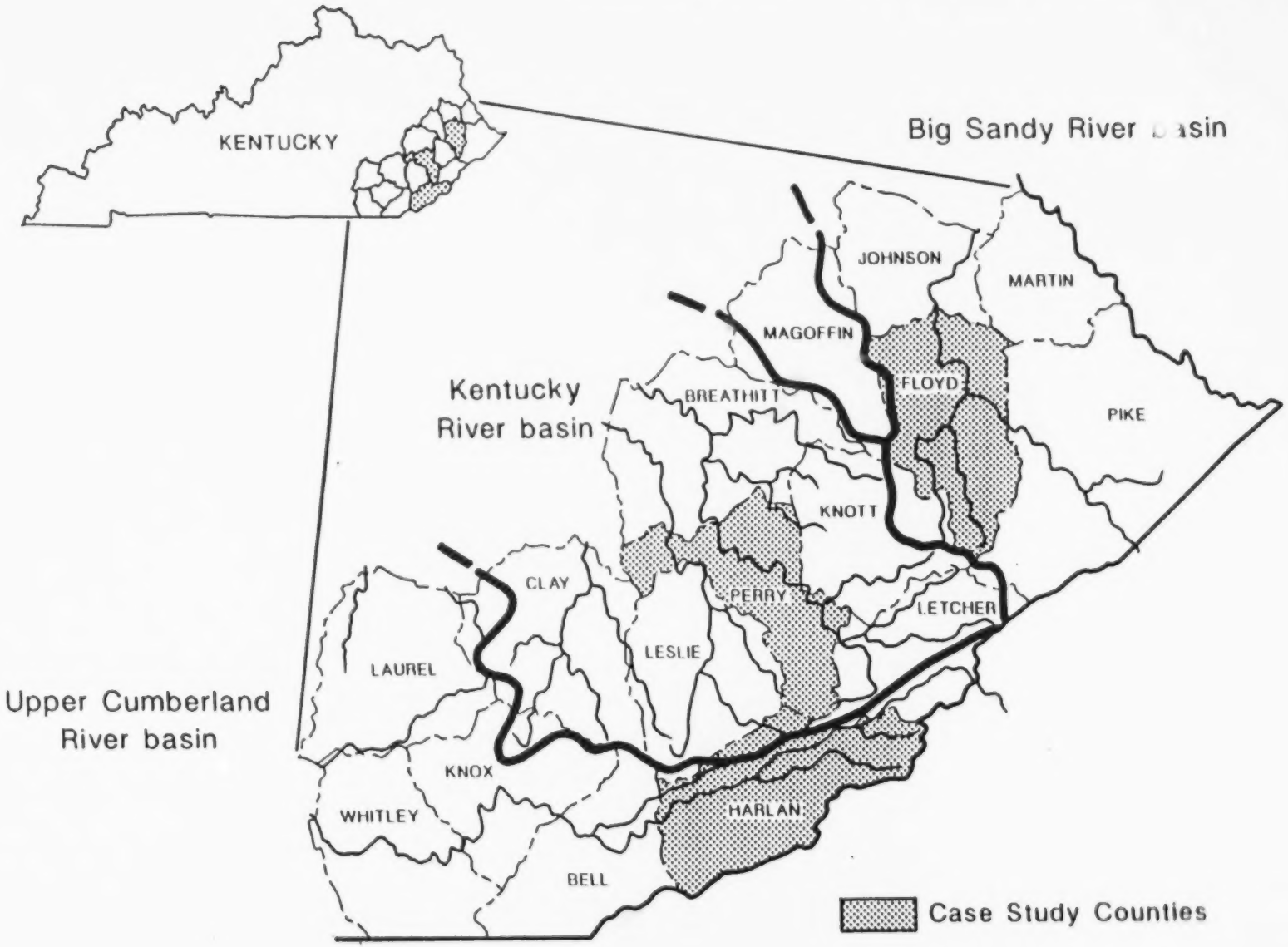
By analyzing the farm economy of Appalachia during the nineteenth century, this article illuminates the developmental links between the region's agrarian and industrial sectors. Lying in the heart of the eastern United States, central Appalachia is a border region whose economic history shares certain general features of the regional economies to the north and south. A crucial difference between the historical agricultural economies of Appalachia and surrounding yeomen regions, however, was that farming in Appalachia did

not undergo a thorough commercial transformation during middle decades of the nineteenth century. Despite some early commodity production, after the 1850's agriculture in Appalachia had become organized around simple subsistence rather than commercial farm production. Thus the focus will be on exploring the limits of subsistence farming for stimulating and sustaining industrialization.

The approach taken here considers regional differentiation a fundamental process within U.S. agricultural and economic history more generally. In Appalachia, as elsewhere throughout the nineteenth century United States, the dynamics of agricultural production provide the key to understanding the longer term development path followed by the regional economy.[3] Ecological differentiation, contrasting social organizations of production and exchange, varying degrees of internal and external economic integration, and differing commodity market structures gave rise to distinct regional systems of agricultural production within the nation. These agrarian systems, in turn, gave rise to enduring regional differences in the historical timing and sectoral patterns of industrialization.[4]

The regional study area embraces 16 Cumberland Plateau counties in southeastern Kentucky as depicted in Figure 1. The study area covers 6,476 square miles of central Appalachia. The study area divides into three distinct drainage basins and, like other parts of central Appalachia, is covered by complex networks of repeatedly branching forks and creeks heading one against the other. The landscape seems a labyrinth of ridges and hollows. With few exceptions, level land is scarce and is found chiefly on alternating sides of only the larger streams and at the mouths of creeks. Because the goal is elucidating relationships between agriculture and industry, the study area purposely includes most principal eastern Kentucky coal fields.

FIGURE 1


KENTUCKY
Big Sandy River basin
JOHNSON
MARTIN
MAGOFFIN
FLOYD
PIKE
Kentucky
River basin
BREATHITT
KNOTT
CLAY
PERRY
LETCHER
LESLIE
LAUREL
Upper Cumberland
River basin
KNOX
WHITLEY
HARLAN
BELL
Case Study Counties

Appalachian Kentucky was settled during the first quarter of the nineteenth century by migrants following the Wilderness Road through the mountains to the Cumberland Gap.[5] Earlier migrants through the Cumberland Gap had bypassed the mountains and pushed on to the central Kentucky Bluegrass.[6] The relative tardiness of mountain settlement has been read as a signal, with the aid of historical hindsight, that Appalachia was a destination of last resort rather than one actively chosen for its own merits. The implication is that mountain settlers were qualitatively different from settlers in other regions, perhaps lacking, for example, the financial resources or moral determination--more likely, both--to make it on the prairies further west.

Marx's dictum that people can only tackle problems history sets before them makes necessary an exercise in historical imagination whereby we attempt to view Appalachian Kentucky through the eyes of a westward migrant in 1810. It thus becomes possible to see that "this rougher country of itself had certain definite assets which invited immigration."[7] Mountain valleys were well watered and empty. Early settlers had their pick of the best bottom lands. "They did not expect to cultivate the steep mountain sides, but to hunt through the forests that covered them, the bear, squirrel, turkey, pigeon, and numerous other animals which lived in the woods in the greatest abundance."8 Moreover, the entire area was forested with hardwoods of such highly prized species as black walnut, oak, hickory, and ash. Contemporary wisdom told potential settlers the forests were ample evidence of local soil fertility. The discovery of numerous salt springs in the mountains--a precious commodity throughout the nineteenth century--was a further positive inducement to settlement.

But perhaps the strongest inducement was cheap land. Although the mountains, like other frontier areas, had been blanketed with overlapping land

grants and patents during the late eighteenth century, *unlike* other areas of new settlement, "there were but few attempts to make good such claims until railroads entered the region" at the turn of the twentieth century.[9] The resource abundance of the woodland mountain environment notwithstanding, land in Appalachia did not generate the same speculative fever during the early nineteenth century as documented on the prairies further west.[10] So the much the better for actual mountain settlers. Scattered evidence from local and oral histories suggest early settlers were able to obtain boundaries of land for comparatively little. In one reported instance, land was purchased for 17 cents an acre.[11] Under quiescent land market conditions, mountain settlers could take out their own patents or become squatters and later claim ownership as a pre-emption right.[12] In either case, they were spared land debt and mortgage burdens by becoming freeholders almost immediately. Relatively ubiquitous freehold tenure would have implications for the ensuing logic of mountain agricultural production.

Attracted by plentiful game, local availability of precious resources like salt, and fertile and relatively cheap land, settlers in southeast Kentucky differed little from their counterparts in other new yeomen farming regions.[13] Household production depended on family labor with tasks generally, but not rigidly, divided according to the age and sex of family members.[14] Husbands and older sons were responsible for heavy work like clearing fields and ploughing, while women bore responsibility for a wide variety of tasks. Also like other family farming regions, at certain critical periods in the agricultural cycle or at moments of family duress, households met labor demands with help from the local community. Springtime field preparation and autumn harvest especially called forth community labor, as the following oral history describes:[15]

> About February you'd go clearing land....They'd [household heads] send one of the older boys out and invite everybody in the whole community to come to the working....They'd come, too....I've seen forty and forty-five [men] and they'd just clean off acres a day....[At harvest] they'd have a big head of corn as big as this room. They'd gather the corn all in and pile it up and they'd all gather around and shuck....Many time me and my dad went to hoe out a crop when [people] were sick....

Further similarities between early mountain farmers and their yeomen counterparts elsewhere existed in the kinds of crops produced. General agriculture prevailed in Appalachia, with grain and livestock production augmented by vegetable gardens and small orchards.[16]

Self-subsistence aims figured largely in the production strategies of early mountain farmers, but evidence suggests they actively engaged in commodity production as well. This was especially true of livestock production.[17] Lewis Gray estimated that during the early decades of the nineteenth century "the per capita holdings of swine in the Cumberland Plateau outranked all other [southern] farming regions."[18] The Appalachian highland south as a whole boasted a higher rate of per capita sheep and cattle production than the lowland south.[19] Mountain terrain unsuitable for row crop cultivation was a haven for livestock. The forested hills, which remained unfenced in Appalachia throughout the century, supported thick underbrush and were laden with acorns and other mast. Under these conditions livestock production required virtually no investment.[20] During the 1830's and 1840's a market for mountain livestock existed in the newly-opened cotton areas of deep south. Livestock drives usually began in central Kentucky, already a center of horse-breeding, and gathered additional stock as they traversed the mountains *en route* south.[21]

But despite commercial opportunities in livestock production, conditions supporting Appalachian Kentucky's place in regional agricultural commerce waned by the mid-nineteenth century. After the 1840's farm production became exclusively organized around simple subsistence rather than commercial production. The subsistence economy sharply differentiated southeast Kentucky from surrounding agricultural regions in the U.S. where commercial relations became entrenched. Before portraying the extent of subsistence production and analyzing the limits of subsistence for subsequent economic development in Appalachia, it is necessary to account for why the Appalachian farm economy was not coupled to the great engine of economic development in the nineteenth century U.S.--the commercial market. This requires considering both internal and external conditions governing development of the agrarian sector.

In the realm of internal conditions, any discussion of the region's agricultural economy must reckon with the inescapable fact that "so far as agricultural land is concerned, East Kentucky definitely has not been blessed."[22] General agriculture in the mountain woodland environment took on distinctive characteristics. The limited amount of alluvial bottom land capable of supporting continuous cultivation necessitated the adoption shifting cultivation on hillsides: "one of the striking features of the agricultural occupation is the continually changing boundary of farm and forest...farms are peninsulas of cultivated land, with changing margins, extending into the forest."[23] When cleared, hillsides became suitable for crop production. Because of declining yields, however, the cycle of clearing and recapture by the forest was short. Depending on local circumstances hillside fields had to be abandoned after 5 to 10 years, but sometimes as soon as 2 to 3 years.[24] The practice of shifting cultivation meant that throughout the nineteenth century, the greater part of farm land in the mountains was

unimproved and, within that category, most was woodland. In 1870, the first census year for which categories of unimproved acreage were enumerated, 65.5 per cent of the total 3,109,640 acres of farm land in the mountain study area were woodland.

Perhaps the most useful explanation of the internal conditions enforcing subsistence production in Appalachian Kentucky is in terms of historian Robert Brenner's concept of "rules for reproduction" operating at the household level of direct agricultural producers.[25] The point of departure is the nature of property relations in the agrarian sector, "the relationships among the direct producers, among the class of exploiters (if any exists), and between the exploiters and producers, which specify and determine the regular and systematic access of the individual economic actors (or families) to the means of production and to the economic product."[26] A "rule for reproduction" is nothing more than the product of the historically specific property relations, defined as "the economic course of action which is rational for the direct producers and the exploiters."[27]

The rules for reproduction operative in the Appalachian Kentucky context were those permitting rural households to subsist outside a market economy--that is, in a situation where economic production was oriented toward family maintenance to the exclusion of competitive commerce. This ability, in turn, was rooted in local property relations, specifically in the sustained ability of farming households to gain non-commercial access to the materials and medium of production: land and labor. Settlers who became landowners relatively cheaply and quickly in an area with a sluggish land market were not compelled to produce for the commercial market. While household surpluses could be and were sold, the existence and extent of surplus were determined only after household needs were met. This meant there were no social class

relations based solely on surplus extraction in Appalachian Kentucky, as between landlords or merchants and direct producers. To use Brenner's phrase, there was no "class of exploiters" in an economic sense.[28] Robert Mutch's description of a similar set of subsistence economic conditions on the eighteenth century Massachusetts frontier is directly relevant to Appalachian Kentucky:[29]

> Merchants stood wholly outside the productive activities that defined the lives of most of their fellow citizens...The merchant entered after the farmer had decided how much of the produce was to be set aside and exchanged for manufactured and processed goods. The commodities the purchase and sale of which constituted the essence of commercial activity were produced completely independent of the merchant. He appropriated the surplus, but only such as he found. No one was obliged to turn over surplus to him, and he could not set production quotas.

At the same time, high birth rates and large families guaranteed a labor supply sufficient for subsistence farming enterprises.

Along with recognizing the environmental conditions governing farm production in Appalachian Kentucky, it is also crucial to recognize that commercialization planted only shallow roots there during the early nineteenth century. And these roots withered. Farmers did not lack an innate capacity for commodity production. But to the extent that an important goal of production was household reproduction rather than monetary accumulation--what is often referred to as "safety-first"--the ability to achieve subsistence, and hence reproduce the household on an annual basis, did not become dependent on the ability to produce for a market.

A host of external conditions also effected the direction taken by Appalachia's farm economy during the nineteenth century. Chief among them were innovations in two key sectors of rural development: farm implements and transportation. A vast literature has documented the highly dynamic

relationships between commercial household agriculture and private and public sector investments in these two sectors.[30] Innovations in farm and transport technologies contributed to deepening commodity relations in other agricultural regions. Yet during the mid-nineteenth century these same innovations had the opposite effect in Appalachia.

Explaining why Appalachian Kentucky lagged behind in these two vital sectors requires considering farm and transport technologies not as *deus ex machina*, but as innovations whose adoption was inextricably bound up with the politics of economic development at the state level. The state level merits emphasis because individual states were critical arenas in which local (sub-state) economies developed during the nineteenth century. Essentially the state level mediated between the local and national levels. In this regard it is useful to consider Appalachia as a composite of several sub-state areas or, as one commentator put it, as the backyard of several southern states. This metaphor is made more useful by amending it to untended backyards--sub-state areas long neglected by southern state governments. Relevant to the Appalachian study area considered here is the political economic context of the border state of Kentucky.

Farm improvement in the U.S. catered almost exclusively to upgrading agriculture governed by quite specific economic and environmental conditions: chiefly competitive commercial production on broad expanses of relatively flat or gently rolling terrain. Social conditions further limited farm improvement to the northern U.S., and specifically the midwest. By the 1850's the midwest became the farm machinery industry's largest regional market. The competitive structure of food commodity markets, coupled with constraints on internal labor supply of household producers, generated a large demand for productivity enhancing equipment.[31] Farm implement and machinery producers who had

initially developed their innovations in the eastern U.S., like John Deere and Cyrus McCormick, followed their markets and made the midwest the center of the farm machinery industry as well.[32] In Kentucky, the farm machinery industry was centered in the Ohio River city of Louisville.

Similar geographical market and environmental conditions circumscribed public sector farm improvement efforts, both nationwide and in Kentucky. Passage of the Morrill Act in 1862 gave individual states financial incentives for establishing agricultural colleges within their borders. Although the Act called for providing a practical education to all farmers, only certain farmers actually benefited from federal mandates. In the case of Kentucky, initial plans for the state's agricultural college had embraced all Kentucky farmers: "the men of the mountain as well as those of the plains."[33] Yet the programs actually developed catered exclusively to the needs of central Kentucky's dominant tobacco farmers:[34]

> With the first research bulletin, the KAES [Kentucky Agricultural Experiment Station] reported research for over three decades aimed at helping tobacco farmers improve their competitive position-- research that tended to benefit the more profitable and highly capitalized farmers who were in a position to implement the new techniques that the University researchers recommended. Eastern Kentucky farmers rarely figured in these early years of experimentation and research.

Furthermore, central Kentucky farmers were defined as the state's "average farmers"--both legitimating the state's commitment to tobacco improvement and foreclosing publicly financed improvements in mountain farming. Exclusive attention to dominant commercial agriculture was not peculiar to Kentucky. Its first agricultural experiment stations and research programs had been modeled on those in midwestern states of Wisconsin, Michigan, and Illinois. With private and public enterprises so attuned to the

supply and demand of flatland farmers, it is perhaps unsurprising that their innovations contributed little to agricultural intensification in Appalachia.

The second set of innovations contributing to stunted commercialization in Appalachia were in inter-regional transportation. That mountain farmers were commodity producers during early decades of the century had been in part due to the continuing importance of overland trade routes in inter-regional commerce.[35] But transportation innovations diverted trade around the mountains and effectively isolated the region, while helping commercially integrate other farm regions in the midwest and upcountry south. Among the most significant and straightforward blows to Appalachia was the opening of Ohio River navigation, which eliminated the need for using overland routes across the Ohio headwaters. Subsequent technological innovations in river transport established the triangular circuit characterizing antebellum inter-regional trade that circumvented central Appalachia. The several canals linking the Ohio and Mississippi River valleys to the Great Lakes and, eventually, the eastern seaport cities had the same effect. Finally, trans-Appalachian railroads, the crowning transport achievement of the antebellum period, further isolated southeast Kentucky and neighboring mountain areas.

Because of the important role of individual states in building transportation infrastructure during the formative era of U.S. economic development, Kentucky's internal improvement policies must bear much responsibility for aiding the economic isolation of the mountain area. Verhoeff's definitive study of mountain transportation suggests that between 1830 and 1850, state aid concentrated on establishing a turnpike system of macadam roads in central Kentucky, investments that were not matched in the mountain region.[36] Thereafter, the third Kentucky constitution of 1850 forbid state investment in transportation schemes and instead required individual

localities and private enterprises to shoulder the burden.[37] Policies requiring public investment to be strictly local in origin proved relatively unproblematic for areas of Kentucky with expanding commercial economies. But for the mountains they spelled disaster.[38] Both the economic and geographical size of local tax bases diminished as new counties continued to be carved out of existing ones.[39] Even in the best of situations, publicly-subscribed transportation improvements in the mountains would have been technically difficult and costly. Constraints on local revenue raising made them impossible.[40]

What, then, of private investment, either from outside or within southeast Kentucky, to improve mountain transportation? Within southeast Kentucky, the slackening of agricultural trade mean there was not a growing reservoir of local capital to finance transportation investments. In this way, the possibility of local enterprise was foreclosed precisely during the era when local transportation connections became a critical source of competitive advantage among local economies.[41] Private Kentucky investment outside the mountains mirrored public aid by remaining highly localized and aimed principally at connecting the seats of commercial agricultural counties with the cities of Lexington and Louisville.[42] Even when the state government did encourage investment in the mountains, as it did in the immediate aftermath of the Civil War, Kentucky investors quickly became diverted to railroad investment linking Kentucky's cities with the lower south.[43] The Louisville-based Louisville and Nashville Railroad, the state's premier rail company, in particular shunned the mountains in pursuit of the ostensibly larger prize of controlling southern commerce. A recurring theme thus emerges in the nineteenth century development of Appalachian Kentucky: when pitted against assured prospects elsewhere, the mountain region could not sustain the

interest of investors. Not until the turn of the century did demand for coal stimulate activity aimed at integrating Appalachian Kentucky into the wider national and international economy.

Taken both separately and together, contemporary improvements in farm technology and transportation represent steps along a "road not taken" by southeast Kentucky's regional economy during the middle decades of the nineteenth century. These years witnessed the progressive isolation of the area's economy from the paths of deepening commercialization and locally-generated capitalist transformation, as economic production became oriented toward simple household subsistence. Perhaps the most significant feature of subsistence production was that it established parameters within which subsequent economic development in Appalachia would--and would not--take place. By characterizing the Appalachian farm economy and comparing it with patterns in the rest of Kentucky, it becomes possible to explore the limits of subsistence.

Historical accounts suggest, and census data confirm, that "all crops commonly found in Kentucky [were] produced on the mountain farms but the average return per acre is usually about one half that of the State as whole."[44] Figure 2 compares farm production during 1850 and 1880 between the 16 county mountain area and the rest of Kentucky across the range of principal output sectors. Data are drawn from the federal Census of Agriculture and are expressed in average farm output.[45] The two years were chosen because the 1850 census for the first time contained a wide array of output sectors and because 1880 is the last census year during which one can speak with confidence about a preindustrial economy in Appalachian Kentucky.

The farm sector in the mountain differed from that in the rest of state not so much in the kind of crops produced, but in the average proportion

FIGURE 2

Composition of Farm Output
Mountain Study Area and Rest of Kentucky, 1850 and 1880

	1850		1880	
	Mountain Study Area	Rest of Kentucky	Mountain Study Area	Rest of Kentucky
Cash Crops				
Tobacco (lbs)	9.0	80.6	8.1	1142.0
Grains				
Corn (bu)	336.0	833.0	263.0	457.0
Oats (bu)	38.0	116.0	13.6	29.0
Wheat (bu)	3.0	31.0	11.4	74.5
Livestock				
Swine	28.0	39.5	11.2	13.6
Sheep	11.7	15.0	5.3	6.2
Milk Cows	3.1	3.3	1.7	1.8
Cattle	6.5	5.9	2.7	3.0
Other Crops				
Peas and Beans (bu)	5.5	2.5	1.4	< 1.
Irish Potatoes (bu)	10.0	21.0	7.0	14.4
Sweet Potatoes (bu)	16.0	13.0	5.5	6.2
Misc. Farm Products				
Butter (lbs)	86.0	137.0	88.2	111.8
Honey and Wax (lbs)	31.5	14.1	9.3	9.3
Wool (lbs)	21.0	31.6	24.4	29.5

SOURCES: U.S. Census of Agriculture, 1850 and 1880, Washington, DC: U.S. Government Printing Office.

produced on each farm. The comparative data on production of Kentucky's chief cash crop, tobacco, are especially striking. Between 1850 and 1880, the gap between average tobacco output widened from just over 70 pounds to well over a thousand. Average output in the mountains actually declined slightly. These numbers support historical claims that most farms in the mountains produced some tobacco, typically expressed as a patch of tobacco rather than tobacco acreage, but output was intended for home use. In 1880, the first census year when crop acreages were separately enumerated, the total number of tobacco acres in the entire study area amounted to only 615.

As the tobacco production figures suggest, during the middle decades of the nineteenth century, tobacco production came to absorb a larger share of crop acreage and reduced the size of the corn crop outside the mountains.[46] But in the mountains, corn was both the "pioneer" and the principal row crop produced in the study area. As one source put it, "in all parts of Kentucky, corn is one of the two major crops, but in the Mountains, it is *the* major crop" (original emphasis).[47] The proportion of cultivated farm acreage devoted to corn production during 1880 was higher in the mountains (50 per cent) than in the rest of the state (35 per cent).

The persisting centrality of corn production was symptomatic of the subsistence orientation within the mountain farm economy. It accords with Danhof's estimation that corn production required little capital investment and was cheaper to produce than other grains,[48] and with more recent estimations that corn, as a general utility grain, was the risk averse crop of choice among small scale farmers during the nineteenth century.[49] Other factors favoring corn production in the mountains was that corn had larger yields than other cereals despite less than ideal conditions of cultivation, was easily stored, required few tools for planting, cultivating and

harvesting, and could be consumed by households without grinding.[50] Because corn was cultivated in a range of topographic conditions, including alluvial bottom and hillsides, yields in the mountains lagged behind statewide figures. During 1880, mountain farms averaged 18.3 bushels of corn per acre versus 32.1 in the rest of the state.

Other crops that reveal significant comparative aspects of the farm output include peas and beans.[51] Beans were not a commercial crop, either inside or outside the study area, but were an important item in the regional diet. As Figure 2 illustrates, beans were a relatively more important part of mountain farm production, being the only sector in which the study area outdistanced the rest of the state during both the 1850 and 1880 census tallies. During the latter year, in fact, mountain study counties accounted for one quarter of the entire state output of beans and peas.

Several other measures underscore differences between the Appalachian subsistence farming system and commercial production outside the region. Farm land values in the mountains were a fraction of those in the rest of the state. In 1850, the average land value of mountain farms was $561, compared with a rest of Kentucky average of $2205. Dollar figures for 1880 were $534 and $1939. Also indicative are farm capital values. By all accounts, mountain farms were not highly capitalized. In 1850, the average value of implements and machinery on mountain farms was $20.50, compared with $73.36 in the rest of Kentucky. Similar disparities obtain in the 1880 data, $14.60 and $63.30, respectively. During the latter year, in fact, only two study area counties recorded an average value of implements and machinery exceeding $30. Frederick Law Olmsted was one of several contemporary travellers who noted the rudimentary methods of mountain farming.[52] All farm work was performed by hand, and the hoe was reportedly the most important tillage implement.

Farm size distributions during 1860 and 1870 contribute suggestive evidence with which to compare the structure of mountain farming with agriculture outside the area. As Figure 3 illustrates, in both the study area and the rest of Kentucky, farm sizes tended to become smaller during the decade. But more apposite to the case being made here is the overwhelming concentration of the mountain study area farms in smaller size categories. In 1860, two thirds (66 per cent) of mountain farms were smaller than 50 acres, while fully 89 per cent were less than 100 acres. The comparative figures for farms in the rest of Kentucky were 38 per cent and 68 per cent. The 1870 saw these figures increase to the extent that 92% of mountain farms were less than 100 acres.[53]

A final set of indices of subsistence production measure the structure of the mountain farm sector over the entire second half of the nineteenth century. These data suggest that despite limitations on the amount or arable land in the region, until the end of the nineteenth century household farming not only remained the center of the economy, but the farm sector continued to expand. "The area was isolated and cut off from the outside world to such an extent that emigration was relatively small in amount, and this, coupled with the rapid increase in population, forced an increase in the number of farms, largely by the process of subdivision."[54] The number of farms in the sixteen county study area increased more than fourfold over the half century, from 5,993 to 31,809. The amount of land in farms (improved and unimproved acreage) increased 56 per cent.[55] Other evidence of an expanding farm sector are data on aggregate improved acreage in the study area. Comparing rates of increase in total farm land area and improved acreage only in Figure 4 shows that as the former stabilized and began to decline, the latter soared by 385 per cent between 1850 and 1900. The increase in improved acreage must be

FIGURE 3

Farm Size Distributions
Study Area and Rest of Kentucky, 1860 and 1870

	1860		1870	
Acres	Mountain Study Area	Rest of Kentucky	Mountain Study Area	Rest of Kentucky
3-9	6.0%	1.7%	13.7%	5.1%
10-19	16.7%	7.4%	24.0%	12.6%
20-49	43.2%	29.3%	38.5%	36.4%
50-99	23.1%	29.4%	16.0%	25.0%
100-499	11.0%	29.0%	6.7%	23.0%
500-999	<1	<1	<1	<1
1000+	<1	<1	<1	<1
FARM NUMBERS	6958	83,689	11,479	106,946

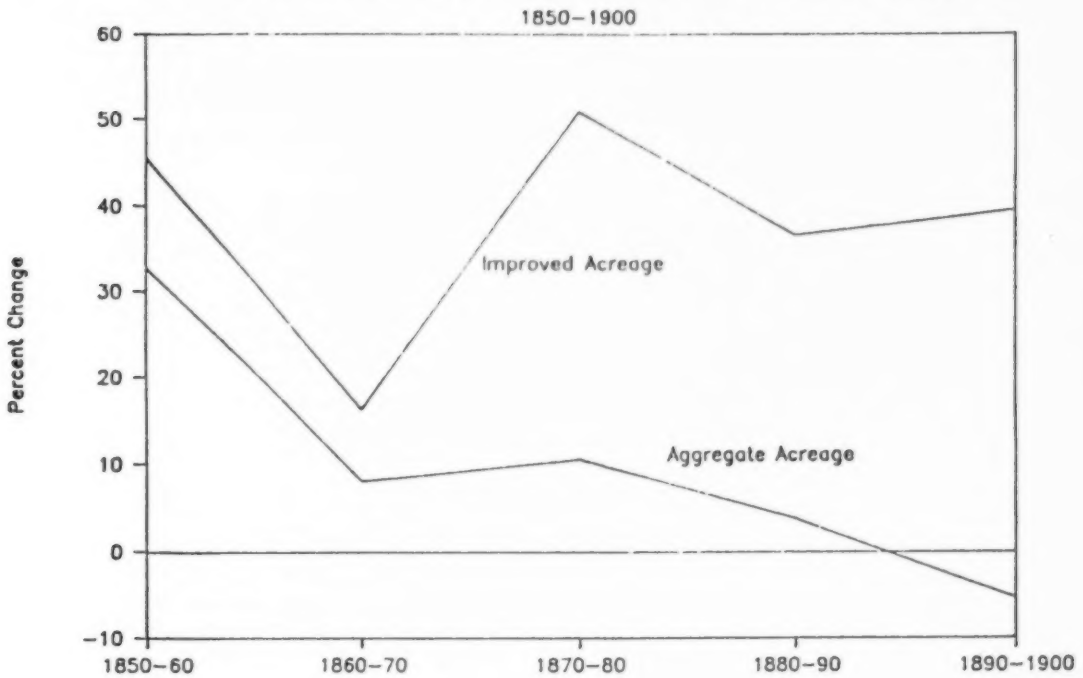
Sources: U.S. Census of Agriculture, 1860 and 1870, Washington, DC: U.S. Government Printing Office.

attributed to new farm creation, moreover, because average improved acreage remained stable throughout the five decades at about 35 acres per farm. Bearing the weight of these changes was average farm size (including improved and unimproved acreage) which, as Figure 5 illustrates, decreased steadily from 362 to 106 acres.

Farmers in Appalachian Kentucky engaged in other forms of primary production by harvesting two naturally occurring elements of the natural environment. One was the medicinal root ginseng which grows wild in the forest. The locations of abundant ginseng sites were much coveted pieces of information because, even in the early nineteenth century, the root fetched a high price on international markets.[56] Timber was also harvested on an annual basis throughout the century, especially hardwoods in demand for furniture veneers.[57] Trees were felled, marked, and dragged to the nearest stream during winter. Springtime flooding carried the logs to market.

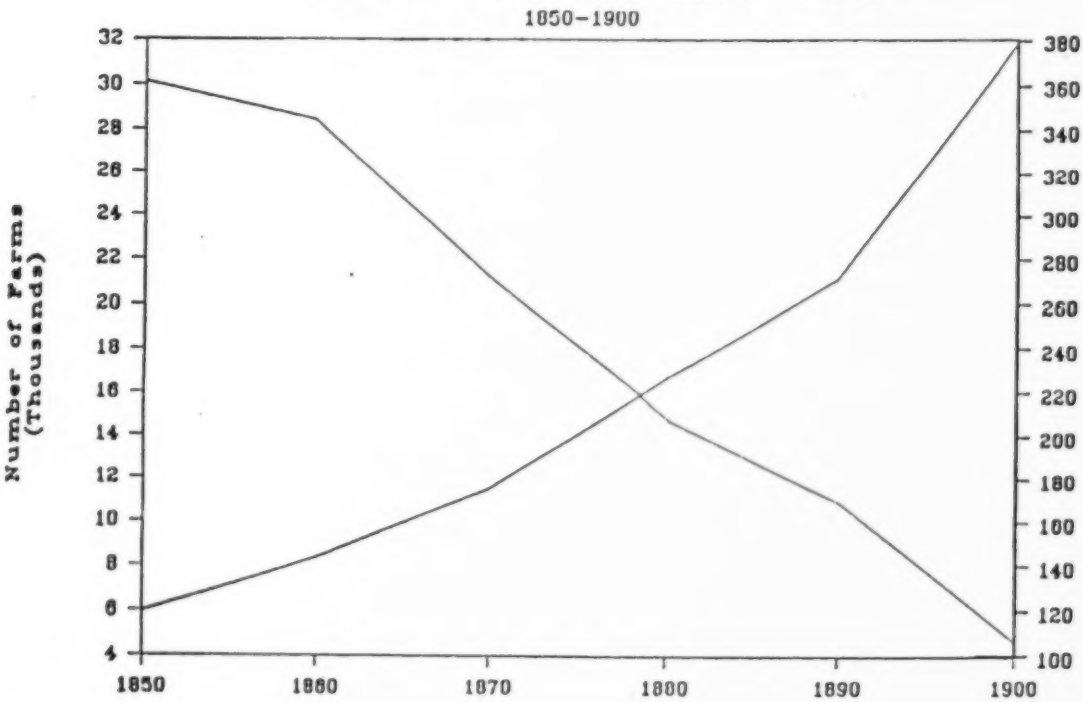
Economic evidence from outside the farm sector, specifically concerning local manufacturing and trade, buttress findings that the preindustrial Appalachian Kentucky economy was oriented toward simple subsistence. Households undertook a wide range of productive activities aside from farming. Especially important were home manufactures: goods made by household members exclusively for use within the household. These were not sideline activities, occupying the family during free time. Home manufacturing in southeast Kentucky was integral to subsistence livelihoods. The vitality of home manufacturing is captured in census data gathered between 1840 and 1870, when households were asked to estimate the annual value of their manufactures. Both per capita and county average values in study area counties were consistently higher than those for the rest of Kentucky. The Kentucky data are part of a wider regional pattern described in Tryon's classic study of

RATES OF CHANGE IN FARM ACREAGE



35

FARM NUMBERS AND SIZE



home manufactures. Tryon noted that in other Appalachian states of Virginia, South Carolina, Georgia and Tennessee "all the counties with a high per capita value in these states were those unfavorably located with reference to rivers, canals, and railroads..."[58] The federal census discontinued gathering data on home manufactures after 1870--a signal of their declining role in household economies in both rural and urban areas. During that year, however, the southern Appalachian region as a whole represented the most concentrated area of highest-valued home manufacturing in the nation.[59] The average value of home manufactures in the Kentucky mountain study area were three times that in the rest of Kentucky, the comparative figures being $29 and $13.

Some of the best accounts of home manufacturing in Appalachia come from the turn of the century. Geographer Ellen Semple left evocative descriptions based on her travels in the Kentucky mountains during the 1890's. Semple especially marveled at mountain homes where:60

> almost everything it contained was homemade...Both rooms contained two double beds. These were made of plain white wood, and were roped across the side through auger holes to support the mattresses. The lower one of these was stuffed with corn-shucks, the upper one with feathers from the geese raised by the housewife...Gourds, hung on the walls, served as receptacles for salt, soda, and other kitchen supplies. The meal barrel was a section of a log, the flour barrel was a large firkin...the churn was made in the same way, and in neither was there a nail or screw. The washtub was a trough hollowed out of a log. A large basket was woven of hickory slips by the mountaineer himself, and two smaller ones made of the cane of the broom corn and bound at the edges with coloured calico, were the handiwork of the wife. Only the iron stove with its few utensils, and some table knives, testified to any connection with the outside world.

The processing of farm products was another important item of home manufacturing. Households used hand mills for grinding corn, especially during dry summer months when water mills ran slack. Beans were dried after

harvest for winter consumption and sorghum was boiled off for use as "long-sweetening" throughout the year. In addition, almost every household kept beehives, "...made from hollowed out sections of the bee-gum tree, covered with a square board, which is kept in place by a large stone."[61]

The paucity of extra-household industry is evidenced by the absence of manuscript schedules in the separate manufacturing census for the study area counties during during the second half of the nineteenth century.[62] The only manufacturing outside the household was saw and grist-milling, and these usually occupied the same mill site and performed "custom work" for individual farmers. Despite the absence of documentation in the manufacturing census, some individuals in each county engaged in general manufacturing activities such as blacksmithing and shoemaking. The population census enumerated a few individuals claiming such artisanal livelihoods in most counties. But the overall argument about a dearth of industry remains valid, however, because unlike in other regions, functional specialization and capitalization did not constitute a trend among artisanal producers.

Commerce in the mountains did not receive much impetus from such varied forms of subsistence production. Households did trade surplus goods with local merchants for items they could not make. Contemporary and historical accounts report trade was conducted almost exclusively on barter terms. Merchants in turn trucked local surpluses to larger markets and upon their return with replenished stores, the cycle of local trade resumed.

Reports filed with the R.G. Dun & Co. during the nineteenth century confirm that commercialization had shallow roots in Appalachia's preindustrial economy. Credit reports on mercantile operations in study area counties from the 1850's through the 1880's reveal that no merchants were specialized by function or commodity. All were described as general stores doing a country

business in dry goods or groceries.[63] A common appraisal of local merchants' credit worthiness was "safe for a small amount only"--a phrase aptly summarizing both prevailing the condition and internal development momentum of Appalachia's subsistence economy.

The dominance of the subsistence farm economy and, relatedly, the minimal scale of commercial development in manufacturing and trade, becomes even more clear in population census schedules in the decades before 1880. A systematic, 100 per cent survey of three study area counties, Floyd, Harlan, and Perry, revealed that in any given census year only a small number of people listed non-farming occupations. In Harlan County during 1860, for example, thirty two people out of a population of 5500 claimed non-farming occupations. In Perry County during the same year only 19 non-farming occupations were enumerated. Somewhat larger numbers--66--were represented in Floyd, a county which always enjoyed comparatively greater commercial activity. Still, in the 1860, 1870, and 1880 censuses, in no county did the number of non-farming occupations amount to even one per cent of the total population.[64]

However quaint or picturesque they may appear in hindsight, subsistence production practices in Appalachian Kentucky, including farming and home manufacturing, were the structural bases of an economy that met the reproduction needs of the region's population. The household was not merely a unit of production and consumption--still common today in the U.S. and elsewhere. More particularly, the household was the unit of consumption for virtually all it produced.

The core relations of household production and reproduction had immediate implications at the local level for potential economic diversification around the agricultural base. Once established as the

dominant form of production, subsistence precluded the development of backward linkages from the farm sector to industries producing farm inputs. Shifting cultivation, an inherently land extensive form of agriculture, substituted land for capital and labor intensification. Furthermore, market competition pressures to increase labor productivity through technological change were largely absent. The persistence of hand cultivation translated into scarce demand for improved farm implements and machinery and, ultimately, the absence of a farm implements industry in the region. Similarly, the dearth of surplus farm production limited the development of forward linkages from the farm sector to processing industries such as meat packing, flour milling, and leather tanning. In sum, because of supply and demand conditions characteristic of subsistence farming, Appalachian Kentucky could not undergo industrialization supported by a sectoral pattern of agriculturally-related manufacturing.

In a more general way, subsistence production circumscribed industrial capital formation in the mountains. The local economy did not stimulate and could not sustain industries that tapped either into farming or the raw material resource base. This not only contributed to an absence of farm related industries, but also--and perhaps more importantly--meant local capital was not available to develop the region's timber and coal resources for export. A local capital shortage suppressed local investment to consolidate resource holdings, construct railroads, open mines, and build towns.

The enduring subsistence economy set limits to locally stimulated and sustained industrialization. As testament to this, the patterns of economic activity described in this article survived into the twentieth century in many areas of Appalachian Kentucky.[65] In 1942 sociologist James Brown entered a

remote section of Clay County lacking improved roads and recorded a subsistence economy strikingly similar to the one described here for the nineteenth century. "In 1942, the farm was still a major source of sustenance...and about 89% of the total farm production was consumed at home."[66]

But the presence of bituminous coal throughout Appalachia Kentucky preempted the possibility that most of the study area counties would remain outside the emergent capitalist industrial economy. National industrial expansion during the postbellum era provoked a continual search for new sources of raw materials. Coal was essential to this expansion, valued for its steam generating capacities and, in the steel industry, as a direct input into production. The coal industry originated in the northern reaches of the Appalachian Highlands but gradually followed the spine of the mountains southward. Using geology as a road map, sooner or later the coal industry was bound to arrive in Appalachian Kentucky. Its probability of doing so was virtually guaranteed after geological reconnaissances in the area during the 1870's and 1880's reported coal seams as thick as a person is tall.

The preindustrial subsistence economy helped determine the eventual historical timing and sectoral pattern of industrialization in Appalachian Kentucky. Industrialization awaited the penetration of external demand for southeast Kentucky's coal resources at the turn of the century. A brief logging boom cleared the forests during the 1880's and 1890's but did not leave a permanent forest products industry. From the start, the industrial base was limited to basic coal production--a sectoral pattern that remains little changed throughout most of central Appalachia. Furthermore, industrialization depended upon external sources of capital investment, both to open the mines and build the railroads. Because of the local dearth of

capital, absentee investors met with little competition in directing development of Appalachia's modern industrial economy.[67]

Beginning in the early years of the twentieth century, the bituminous coal industry arrived in Appalachian Kentucky to satisfy resource demands of an industrial economy many hundreds of miles distant. But its arrive did not merely follows an inexorable geographical logic of the coal industry, or of the larger capitalist economy. Its specific timing and sectoral and social patterns of investment were governed, too, by the region's agricultural history and geography.

[1] Ronald D. Eller, *Miners, Millhands, and Mountaineers; Industrialization of the Appalachian South, 1880-1930*. Knoxville: University of Tennessee Press, 1982.

[2] The colonial interpretation pervades much historical writing on Appalachia. A seminal statement is Helen Lewis and Edward Knipe, "The Colonialism Model: the Appalachian Case", In Helen Lewis, etal., editors, *Colonialism in Modern America; the Appalachian Case*. Boone: Appalachian Consortium Press, 1978, pp. 8-31.

[3] James Alexander Field makes an exemplary case for examining agrarian economic roots of industrialization in the U.S. in his "Sectoral Shift in Antebellum Massachusetts," *Explorations in Economic History* 15:2, 1978, pp. 146-171.

[4] David R. Meyer, "Emergence of the American manufacturing belt: an interpretation," *Journal of Historical Geography* 9:2, 1983, pp. 145-174; Charles Post, "The American Road to Capitalism," *New Left Review*, No. 133, 1982, pp. 30-51; and Max Pfeffer "Social Origins of Three Systems of Farm Production in the United States," *Rural Sociology* 48:4, 1983, 540-562.

[5] An evocative account of migration to and settlement in the mountains is contained in John Egerton, *Generations*, Lexington: University Press of Kentucky, 1983, Chapter Five.

[6] Darrell Haug Davis, *The Geography of the Mountains of Eastern Kentucky*. Lexington: Kentucky Geological Survey, 1924, pp. 4-5.

[7] John C. Campbell, *The Southern Highlander and His Homeland*. New York: Russell Sage Foundation, 1921, p. 41. So powerful were negative assumptions about the qualities of Appalachian settlers that studies like Campbell's frequently exert themselves to justify why settlement in the mountains was a rational act. One of the earliest dissertations written about Appalachia

apparently had as its explicit goal demonstrating that mountain settlers were of similar racial stock to Bluegrass settlers further west. See Virginia McClure, *The Settlement of the Kentucky Appalachian Highlands*, Ph.D. dissertation, University of Kentucky, 1933.

[8] McClure, 1933, pp. 91-92.

[9] Mary Verhoeff, *The Kentucky River Navigation*. Louisville: Filson Club Publication, 1917, p. 137. Ajudicating original surveys and patents granted by the state of Virginia became an issue in the mountains only during the late nineteenth century when capital investment the region's resources. See also Edward C. O'Rear, "Eastern Kentucky," *The Filson Club Quarterly* 28:2, 1954, pp. 116-117.

[10] On land speculation in the Bluegrass region see Paul Gates, "Tenants of the Log Cabin," *Mississippi Valley Historical Review* 49:1, 1962, pp. 3-31.

[11] Campbell, 1921, p. 45.

[12] There exists no definitive history or case study of land acquisition in Appalachian Kentucky. Thus, one must piece together corroborating evidence from historical accounts to make claims about this important historical process. By all accounts, land acquisition seems to have been a casual process whereby settlers simply claimed apparently unoccupied lands. This lead to much confusion during ensuing decades because several individuals could and often did claim the same boundary of land. A good description is Egerton, 1983, pp. 48-51.

[13] Recent interpretations of U.S. agrarian social history that suggest similarities between Appalachia and other regions of family farming include James Henretta "Families and Farms: Mentalite in Preindustrial America," *William and Mary Quarterly* 1978 26:1, Third Series, pp. 3-32; Michael Merrill "Cash is Good to Eat: Self Sufficiency and Exchange in the Rural Economy of

the United States," *Radical History Review* 1977 pp. 42-71; Steven Hahn and Jonathan Prude, eds., *The Countryside in an Age of Capitalist Transformation*. Chapel Hill: University of North Carolina Press, 1985. A recent attempt to apply some of this scholarship to the Appalachian region is Dwight Billings, etal. "Culture, Family, and Community in Preindustrial Appalachia," *Appalachian Journal* 13:2, 1986 pp. 154-170.

[14] McClure 1933, 167 and Alan Banks, *Labor and Development of Industrial Capitalism in eastern Kentucky, 1870-1930*. Ph.D. dissertation, McMaster University, 1980, p. 35.

[15] Laurel Shackelford and Bill Weinberg, *Our Appalachia*. New York: Hill and Wang, 1978, pp. 19-21.

[16] Lewis C. Gray, *History of Agriculture in the Southern United States* (two volumes). Gloucester, MA: Peter Smith, 1933, Vol. II, p. 884.

[17] Frederick Law Olmsted, *A Journey in the Backcountry*, New York: Mason Brothers, 1863, p. 223.

[18] Gray, 1933, Vol. II, p. 884. This statement was based on data from more counties than are included in the present study area.

[19] This statement is based on Gray, 1933, Vol. II, Table 33, page 876.

[20] James Otto, "The Migration of the Southern Plain Folk: An Interdisciplinary Synthesis," *Journal of Southern History* 51:2, 1985 pp. 183-200.

[21] Elizabeth L. Parr, "Kentucky's Overland Trade with the Antebellum South," *Filson Club Quarterly*, 2:2, 1928, pp. 71-81.

[22] Mary Jean Bowman and Warren Haynes, *Resources and People in East Kentucky*. Baltimore: The John Hopkins Press, 1963. p. 8.

[23] Davis, 1924, p. 60.

[24] Verhoeff, 1917, p. 144.

[25] Robert Brenner, "The Social Bases of Economic Development," in *Analytical Marxism*, Cambridge University Press, 1986, pp. 23-53, esp. pp. 25-29.

[26] Brenner, 1986, p. 26.

[27] Brenner, 1986, p. 26.

[28] This is not to suggest preindustrial Appalachia was a land of simple egalitarian self sufficiency. For an analysis of social dynamics during the preindustrial era, see Mary Beth Pudup, "The Boundaries of Class in Preindustrial Appalachia," *Journal of Historical Geography* 15:2, 1989.

[29] Robert Mutch, "Yeoman and merchant in pre-industrial America: eighteenth century Massachusetts as a case study," *Societas* 7:4, 1977, p. 296.

[30] Clarence Danhof, *Change in Agriculture: The Northern United States*. Cambridge: Harvard University Press, 1969; Alan Olmstead, "The Mechanization of Reaping and Mowing in American Agriculture, 1833-1870, *Journal of Economic History*, 35:2, 1975, 327-352.

[31] On the dynamics of household farming in the northern U.S. see Harriet Friedmann, "World Market, State, and Family Farm: Social Bases of Household Production in an Era of Wage Labor," *Comparative Studies of Society and History* 20:4, 1978, pp. 545-586. A definitive comparison of farm and plantation dynamics is Gavin Wright, *The Political Economy of the Cotton South*. New York: Norton, 1978, Chapter Three.

[32] See Mary Beth Pudup, "From Farm to Factory: Structuring and Location of the U.S. Farm Machinery Industry," Economic Geography 63:3, 1987, pp. 206-222.

[33] cited in Sally Maggard "From Farmers to Miners: the Decline of Agriculture in Eastern Kentucky," in L. Bush, ed., *Science and Agricultural Development*. Totowa, Allanheld, 1982, p. 44.

[34] Maggard, 1982, p. 45.

[35] Gray, 1933 Vol. II, p. 869.

[36] Verhoeff *The Kentucky Mountains: Transportation and Commerce 1750-1911*. Louisville: Filson Club Publication, 1911,p. 169.

[37] Carl Boyd, "Local aid to railroads in central Kentucky, 1850-1891," *Register of the Kentucky Historical Society* 62:1-2, 1964, p. 8.

[38] Verhoeff, 1911, p. 54.

[39] As in its parent state Virginia, the county became the basic unit of local government in Kentucky. New Kentucky counties were continually carved from existing ones throughout the nineteenth century for a variety of political and economic reasons. As a result, the total number of Kentucky counties is very large (119) while their geographical size are often very small. Good discussions of Kentucky's peculiar county system are Robert Ireland, *The County in Kentucky History*. Lexington: University Press of Kentucky, 1976; and *Little Kingdoms: the Counties of Kentucky*. Lexington: University Press of Kentucky, 1977.

[40] An excellent analysis of conditions governing nineteenth century road improvement in Appalachian Kentucky is Verhoeff, 1911, chapter 5.

[41] David Weiman, "Farmers and the Market in Antebellum America: A View from the Georgia Upcountry," *Journal of Economic History* XLVII:3, 1987, pp. 627-647.

[42] Boyd, 1964, pp. 5-6.

[43] E. Merton Coulter, *Civil War and Readjustment in Kentucky*, Gloucester, MA: Peter Smith 1966, 373-378. Coulter provides perhaps the best analysis of failed efforts to integrate the mountain economy in the immediate postbellum era.

[44] Verhoeff, 1917, p. 138.

[45] All numerical measures of farm production stated in this article are drawn exclusively from published table in the decennial federal Census of

Agriculture, various volumes, various years, Washington: U.S. Government Printing Office.

[46] Davis, 1924, p. 68.

[47] Davis, 1924, p. 63.

[48] Clarence Danhof, "Farm Making Costs and the Safety Valve," *Journal of Political Economy* 49, 1941, pp. 317-359.

[49] The estimations of corn production as a risk averse strategy have been made principally for southern household farms who had divided their output between corn and cotton. See Gavin Wright and Harold Kunreuther, "Cotton, Corn, and Risk in the Nineteenth Century,: *Journal of Economic History* 35:3, 1975, pp. 526-551 and Weiman, 1987. Although Appalachia was not a cotton producing region, the general point about corn production remains relevant to the Appalachian case.

[50] Davis, 1924, pp. 67-68.

[51] Beans comprised the overwhelming bulk of this category in both census tallies.

[52] Olmsted, 1863, p. 225.

[53] Data from 1880 were excluded because resource speculation in the Appalachian Kentucky, which commenced shortly after the Civil War, had begun changing the structure of land ownership in the region.

[54] Davis, 1924, pp. 50-51.

[55] This overall increase in farm land area masks a downward trend begun during the 1890-1900 decade. During the industrialization decades of 1890 to 1920 the amount of land in farms declined 561,086 acres.

[56] Verhoeff 1917, p. 142. The annual ginseng season still sends thousands of people into the mountains in Appalachia to collect the root for sale.

[57] This was the common practice before the advent of commercial logging in Appalachian Kentucky during the 1880's and 1890's. For an account of these practices, see Thomas Clark, "Kentucky Logmen," *Journal of Forest History* 25:3, pp. 144-158.

[58] Rolla Tryon, *Household Manufactures in the United States 1640-1860*. Chicago: University of Chicago Press, 1917, p. 374.

[59] Leonard Brinkman, "Home Manufactures as an Indication of an Emerging Appalachian Subculture, 1840-1870." *West Georgia College Studies in the Social Sciences*, Vol. XII (June 1973).

[60] Ellen Churchill Semple, "The Anglo-Saxons of the Kentucky Mountains: a Study of Anthropogeography," *The Geographical Journal* 17:6, 1901, pp. 597-598.

[61] Semple, 1901, p. 599.

[62] This statement is based on a survey of manufacturing census schedules for study area counties during the nineteenth century. Microfilm copies of the schedules are located in the Special Collections of the University of Kentucky Library. Captured on a rare manufacturing census schedule, the situation in Floyd county during 1880 is illustrative. The firm Davidson & May operated a flour and grist mill and a lumber and sawmill on the Sandy River valued at $2800 and $2500, respectively. Production at the former mill was valued at $5500. Accounting for this sum were 144,000 pounds of corn meal and 28,350 of flour. The milling of all grains by Davidson and May was done on a "custom" basis for individual farmers in the locality. The firm's sawmill was a commercial operation, not surprisingly for 1880 because commercial logging was beginning to penetrate southeast Kentucky by that date. During 1880, Davidson and May's sawmill produced 300,000 board feet of lumber, valued at $1.00 per board foot.

[63] Wholesale merchants from outside the region, in cities like Baltimore and Cincinnati, provided merchandise to local general store merchants on credit. The R.G. Dun & Company, forerunner of today's Dun & Bradstreet, provided the service of estimating the credit-worthiness of merchants throughout the nation. Payments to wholesalers were made chiefly with locally-bartered goods and to lesser extent in cash. Dun & Co. employees frequently lamented the cash poor situation of merchants in the mountains. See Kentucky volumes 12 (Floyd County), 16 (Harlan County), and 37 (Perry County), R.G. Dun & Co. Collection, Baker Library, Harvard University Graduate School of Business Administration.

[64] Furthermore, claiming a non-farming occupation did not mean necessarily that the person did no farming. Social dynamics during the preindustrial era, including occupational roles, are explained in Pudup, 1989.

[65] Harry K. Schwarzweller, James S. Brown, and J.J. Mangalam, *Mountain Families in Transition*. University Park: Penn State University Press, 1971.

[66] Schwarzweller, etal, 1971, pp. 6.

[67] The relationships between absentee capital investors and the local elite are explored in Pudup, 1989.